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(54) **Packing Trays**

(57) A tray e.g. moulded from pulp fibre for supporting cartons of frusto-conical configuration includes carton receiving pockets (40). The pockets (40) are defined between upwardly projecting portions (21)—(24), whose surfaces slope at about 15° to the vertical to facilitate resting, while the cartons are supported by groups of four openings (50), whose edges define surface portions (60) rising at about 7° to the vertical to provide positive location of the cartons. The tray may include ventilation holes e.g. for facilitating chilling of yoghurt in the cartons.

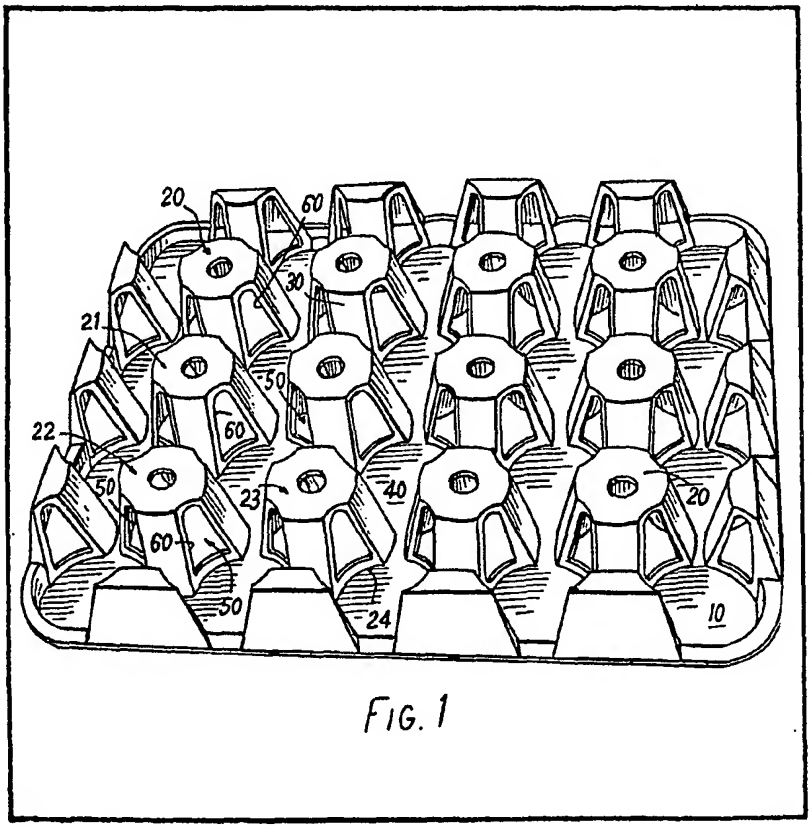

FIG. 1

The drawings originally filed were informal and the print here reproduced is taken from a later filed formal copy.

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FIG. 1

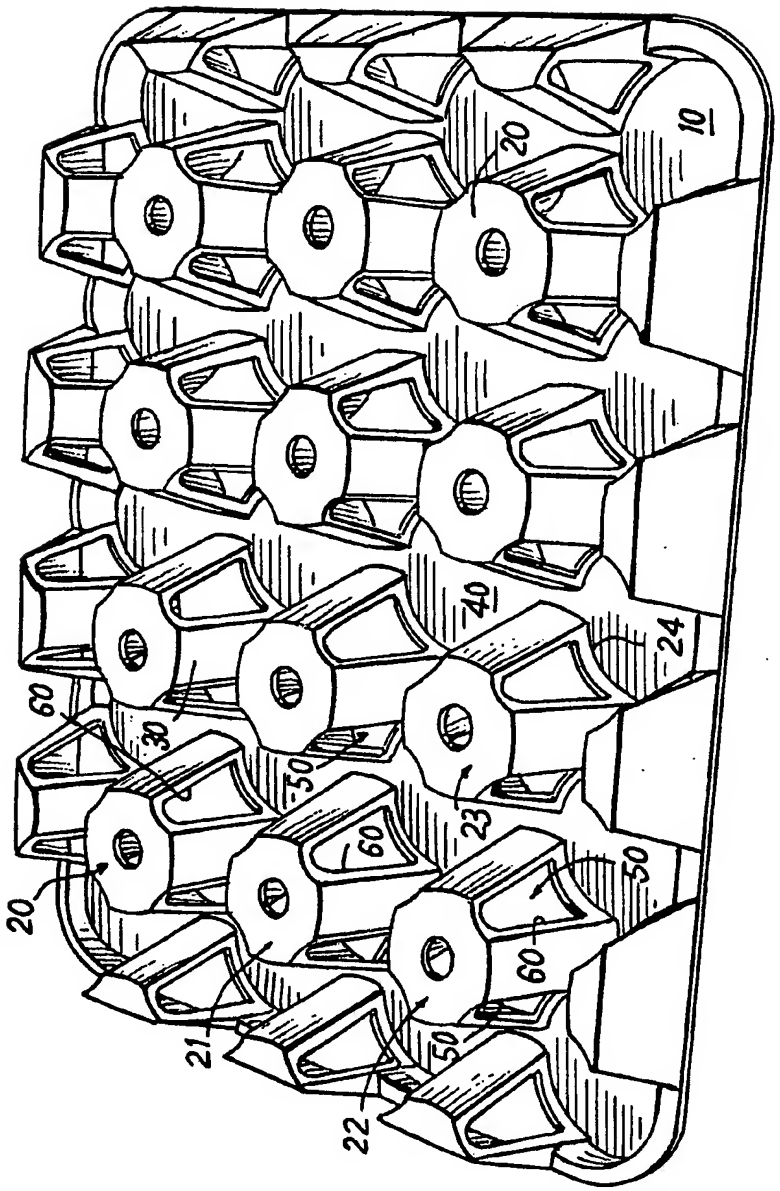

FIG. 2

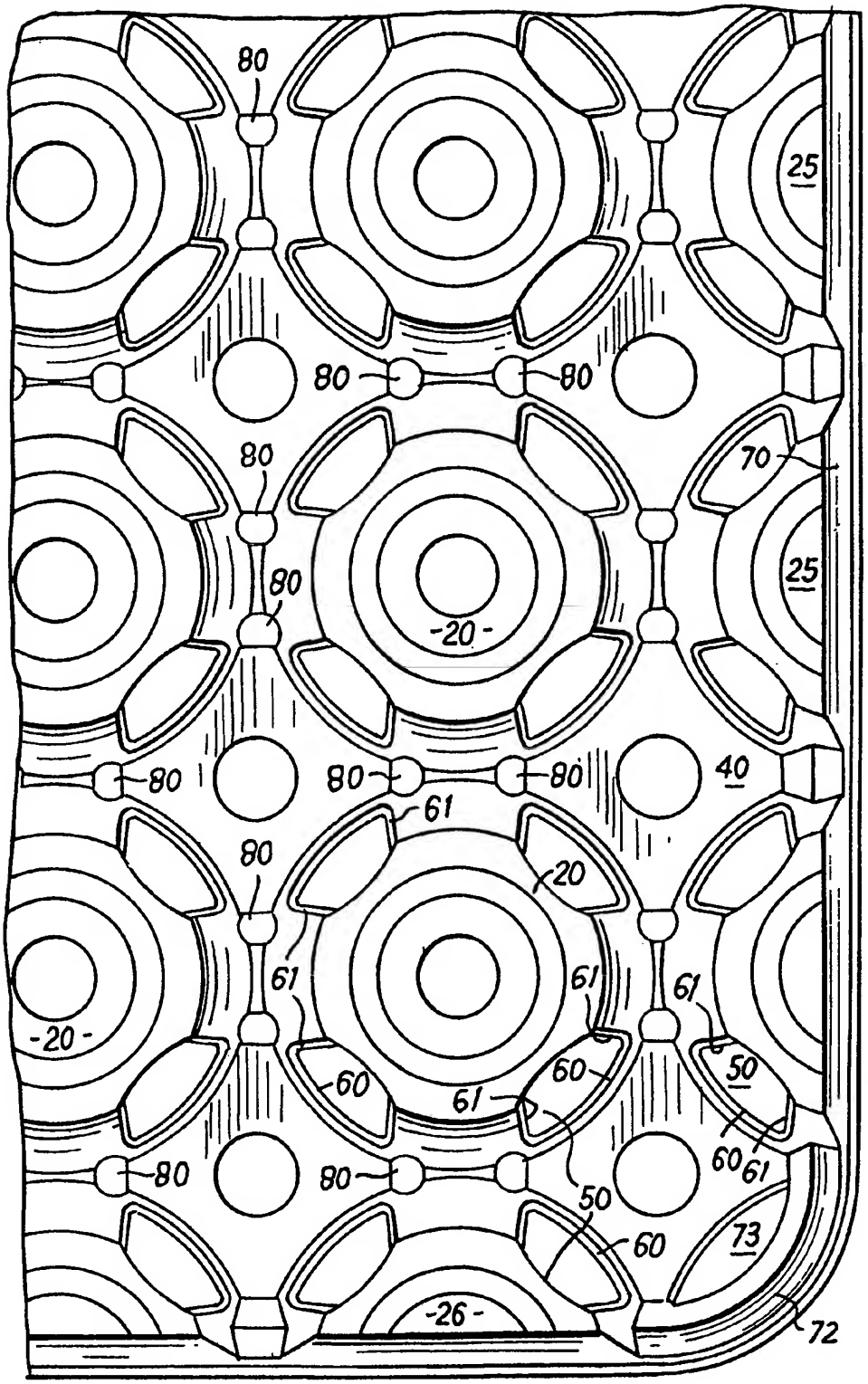
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FIG. 3

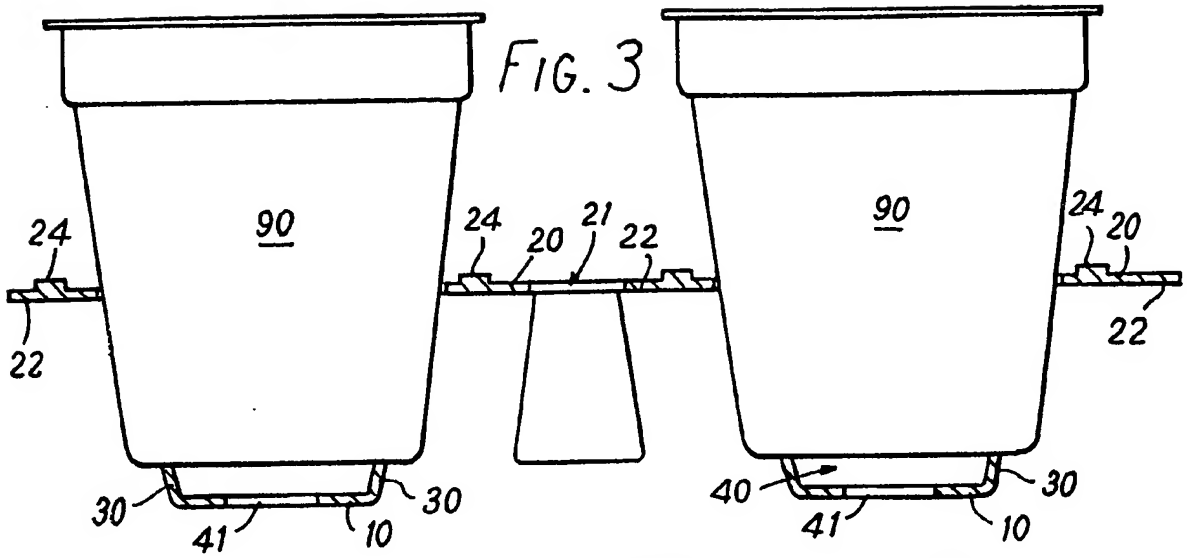


FIG. 4

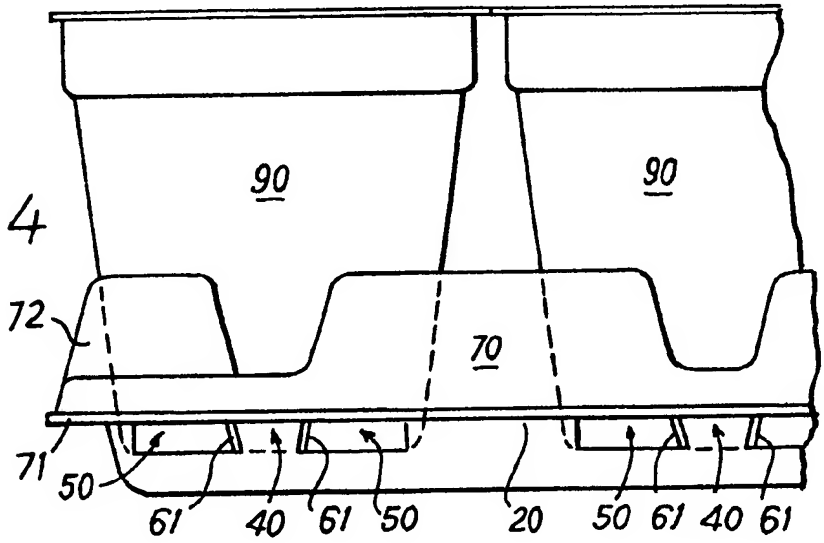
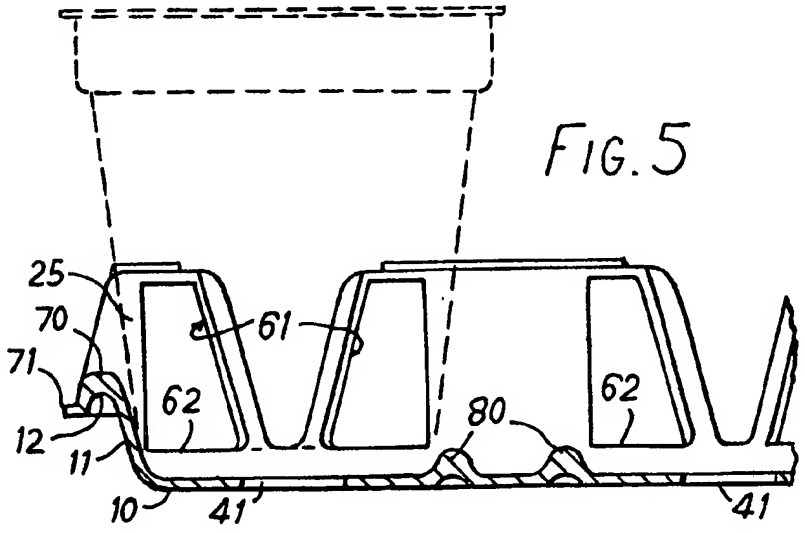


FIG. 5



SPECIFICATION

A Tray for Cartons

This invention relates to a tray for cartons, and more especially but not exclusively, to a tray moulded from pulp fibre.

Moulded trays are well known. Many different pulp trays have been proposed for egg packaging, meat and fruit packaging. Such trays have been designed to nest in a stack which occupies minimum space for transit of empty trays and also for stacking, if appropriate, when in use: egg trays and apple trays are stacked after filling, but not meat trays.

Pulp trays hitherto have been employed for their advantageous properties including economic manufacture, requiring a minimum storage space, and the hygenic property of absorbing spillage whilst also being biodegradable and thus avoiding the disposal problems of some plastics materials. Generally speaking therefore, the main use of pulp trays has been in relation to foodstuffs directly in contact with the trays for which the above stated properties render pulp trays especially suited.

For the packaging of other products, other materials have predominated hitherto. For packaging of yoghurt cartons, it is widespread to use trays formed of cardboard. When it is desired to locate positively each upper carton, trays are used which have an upper carton positioning layer and a lower carton supporting layer separated by side walls. The upper layer has a series of apertures or cut-outs each dimensioned to receive an individual yoghurt carton. Such trays are formed from blanks which are assembled after delivery to the yoghurt manufacturer or packer. The assembly of the trays either necessitates the availability of manual labour to assemble the trays at the users location and the related labour costs, or the availability of machinery with the related investment in plant costs and maintenance plus the disadvantage of standdown time in the event of breakdowns.

In this context, it has been appreciated that a mould tray especially a moulded fibre tray offers particular advantages for the packaging of cartons such as yoghurt cartons. When this proposal was first considered it became apparent that the main problem facing the designer of a suitable tray related to the ability of the tray to nest and to be readily removable from a nest of trays. The contour of the cartons differs from that of objects such as eggs and apples for which previously tray designs had been made which enable stacked and nested empty trays readily to be removed individually.

The characteristic of the species of carton to be held by the tray under consideration is that it has a circumferential wall of circular cross-section but which tapers upwardly in the elevational section. In one particular instance, the tray is required t p sitively locate cartons in which the angle of inclination is in the order of 7 degrees. It is found that simply moulding a tray with pockets in an otherwise continuous upper surface of the tray cannot meet both the criteria that the cart ns are individually positively located and the trays are readily removed individually from a nested stack. If th trays are to be r adily removable, the inclination of the wall portions of the pockets to the vertical, defined with respect to the base plane of the tray, must be in the order of 15 degrees for pockets each conforming in general shape or configuration to that of a carton of frusto-conical form. A steeper inclination of the wall portions, such as an inclination of 7 degrees gives rise to the problem that the trays are not capable of nesting properly to form a stack or that the degree of nesting is such that the separation between the upper surfaces of consecutive trays results in the stack being of such a height as to substantially lose the benefit of nesting in the sense that the stack is unduly high. On the other hand, if the inclination of the wall portions of the pocket is sufficiently greater than 7 degrees to allow proper nesting, such as 15 degrees, then the wall portions of the pockets extend away from the wall of cartons placed therein and do not locate the cartons positively.

The present invention seeks to provide a tray for cartons of frusto-conical configuration in which the cartons may be placed to be individually positively located whilst ensuring that the tray is nestable to form a stack having a height which is substantially reduced relative to the height a stack corresponding to the simple multiple of the number of trays and the depth of one tray.

According to one aspect of the present invention there is provided a tray for cartons comprising

A base layer of tray material,

A plurality of tray pockets upstanding from said base layer,

wall portions of said tray pockets having an inclination relative to the base layer such as to enable similar trays to be arranged with their tray pockets nested to form a stack,

at least one group of said tray pockets being so disposed relative to each other to define a carton receiving location depending therebetween and configured to define a carton receiving pocket in which a carton may be placed and positively located.

Although as will become apparent hereafter, it is intended that the preferred embodiments of the trays will be moulded from material such as paper pulp, other fabrication techniques are possible. If the fabrication material were cardboard or plastics material, it is conceivable that the pockets could be formed separately from, but subsequently secured to, the base layer in this case, different types or thicknesses of materials may be used for the base and the tray pockets.

In the preferrred mbodiment, the base layer and tray p ckets are formed integrally from the same material.

It is an advantageous feature that the wall portions of said group of pockets have openings therein which openings define carton locating

surfaces of the wall portions, wherein said carton receiving pocket is defined by said carton locating surfaces. The wall p rtions which bound said openings have a generally similar configuration on both sides of the tray.

The preferred material for the carton tray is pulp fibre because of its hygenic properties, capability to absorb spillage and bio-degradability, plus the economics of manufacture which pulp affords.

In an embodiment there is a regular array of tray pockets in the tray with each group of contiguous pockets having the carton locating surfaces of a carton locating pocket.

The preferred tray has peripheral pockets which have the appearance of half the tray pockets and are closed at the periphery of the tray by a peripheral side wall. Webs are provided on said base layer of the tray which extend between said tray pockets for increasing the rigidity of the tray.

In one embodiment, the inclination of the wall portion of each tray pocket relative to the vertical through said base layer is in the order of 15 degrees, whereas the depending carton locating surfaces define a surface having an angle in the order of 7 degrees to said vertical. The preferred embodiment provides a tray for yoghurt cartons. It is found that the carton locating pockets of this tray is capable of positively locating a yoghurt carton of complementary configuration. It will be appreciated that, when located in a carton locating pocket, a carton projects above the tray. The optimum height for the pocket wall portions relative to the carton height is minimized in order to reduce the volume of pulp required to fabricate each tray and thus fabrications costs. By using openings to define carton locating surfaces to define the carton locating pockets, these pockets exert a positive locating effect on the cartons inserted therein which allows the extent of the carton above the tray to be maximized.

Embodiments of the invention will now be described by way of example only, with reference to the accompanying drawings, in which :—

Fig. 1 shows a perspective view from above of a first embodiment of a carton tray;

Fig. 2 shows a portion of a plan view of a carton tray similar to that of Fig. 1;

Fig. 3 shows an elevational section taken through pockets forming part of the tray of Fig. 2 in which cartons are present;

Fig. 4 shows a fragmentary portion, in side view of the tray of Fig. 2; and,

Fig. 5 shows a section through the portion of the tray also shown in Fig. 4.

In Fig. 1 there is shown a carton tray according to a first embodiment. Th tray has a base layer 10 of tray material and a plurality of tray pockets 20 upstanding from said base layer 10. Wall portions 30 of said tray pockets 20 have an inclination relative to the base layer 10 such as to nable similar trays to b arranged with their tray pockets 20 nested to form a stack. The pock ts 20 form a regular array covering the usable area of the base layer 10.

In Fig. 1 one group of said tray pockets 21 to 24 are so disposed relative to each other to define a carton receiving location 40 depending therebetween and configured to define a carton receiving pocket in which a carton may be placed and positively located, In this embodiment, the pockets 20 are so disposed to provide a plurality of said groups and consequently a plurality of carton receiving locations 40.

In this embodiment, the tray is moulded from pulp fibre with the result that the base layer and tray pockets are formed integrally from the same material. The wall portions 30 of said group of pockets 21—24 have openings 50. The openings 50 define carton locating surfaces 60 of the wall portions 30. The carton receiving pockets at each location 40 is defined by carton locating surfaces 60 in the wall portions 30 disposed in that group of pockets 21 to 24. The wall portions 30 which bound said openings 50 have a generally similar configuration on both sides of the tray.

Turning to Fig. 2, which relates to a tray generally similar to that of Fig. 1 there is a regular array of upstanding tray pockets 20 in the tray with each group of contiguous pockets having the carton locating surfaces 60 of a carton locating pocket in each carton receiving location 40. It will be seen from Fig. 2 that this tray has peripheral tray pockets 25 which have the appearance of half the tray pockets 20 and are closed at the periphery of the tray by a peripheral side wall 70. Webs 80 are provided on said base layer 10 of the tray which extend between said tray pockets 20,25 for increasing the rigidity of the tray.

In the Fig. 2 embodiment, the inclination of the wall portion 30 of each tray pocket 20 relative to the vertical through said base layer 10 is in the order of 15 degrees. By contrast, the depending carton locating surfaces 61 define a surface having an angle in the order of 7 degrees to said vertical. This embodiment provides a tray for yoghurt cartons 90, shown in Figs. 3 to 5. It is found that the carton locating pockets in the locations 40 of this tray are capable of positively locating a yoghurt carton of complementary configuration. It will be appreciated that, when located in a carton locating pocket at a location 40, a carton 90 projects above the tray pockets 20. The optimum height for the pocket wall portions 30 relative to the carton 90 height is minimized in order to reduce the volume of pulp required to fabricate each tray and thus fabrication costs. By using openings 50 to define carton locating surfaces 60, 61 to define the carton locating pockets at locations 40, these locating pockets exert a positive locating effect on the cartons 90 inserted therein which allows the extent to the carton above the tray to b maximized. As shown in Figs. 3 to 5, the height of the pockets 20 is substantailly qual to half the height of the cart ns 90.

From Figs. 3 to 5 it is possible to see the manner in which a carton 90 sits in a carto

locating pocket at a location 40 depending betw en tray pock ts 20 formed of tray material. The sectional view of Fig. 5 illustrates the contour of the side walls 70 and the junction thereof with the base layer 10. As shown the side walls 70 extend around the perimeter of the tray and present rounded corners 72 (Fig. 4) to the tray, whilst also closing the peripheral tray pockets 25. The base layer 10 extends upwardly at the perimeter of the tray in a raised flange 11 (Fig. 5) and then has an inverted U-portion 12 merging into an outwardly extending lower flange 71 of the side wall 70. The webs 80, as shown in Fig. 5, in the moulded pulp tray are formed integrally with the base layer as peaks in the material of the trays of increased thickness. Figs. 4,5 clearly illustrates the manner in which the provision of openings 50 in the wall portions 30 of pockets 20,25 define the carton locating surfaces 60,61. The surfaces 61 are inclined to the base at an angle complementary to that of the sides of the cartons 90. The lower surfaces 62 defined by the openings 50 provide the bottom surfaces of the carton receiving pockets at locations 40.

For ventilation of the tray, the base layer 10 at the centre of each carton receiving location 40 is provided with an aperture 41 (as shown in Figs. 2 to 5). Likewise, as indicated in Fig. 3 the upper surface 22 of the pockets 20 is also provided with an aperture 21 for ventilation. Each surface 22 is also provided with a circular ridge 24.

Modifications will commend themselves to those skilled in the art. Fig. 1 shows a tray without apertures in the base layer 10. Fig. 2 shows the corners 72 reinforced at the uppermost surface of the base layer 10 by means of integral strengthening elements 73. The precise configuration shown in Fig. 5 for the contour of the side wall 70 and the base layer portions 11,12 extending between the flange 13 of wall 70 and the major surface of the base layer 10 has been designed with the fabrication of the tray by moulding from pulp fibre in view. If the tray is formed from other materials, for example plastics material by vacuum forming, then variations in the configuration of side walls 70 and the perimeter of the base layer 10 will necessarily result.

The preferred tray, moulded from pulp fibre has the openings 50 which add to the ventilation of the tray which is especially advantageous in certain yoghurt packaging procedures. Continental yoghurt manufacturers fill the cartons, load the filled cartons into trays and then place the trays on pallets in a cold room, where cold air is employed to chill the yoghurt in order to terminate fermentation. The duration of the storage in the cold room is reduced by impr ved ventilation of the trays and this results in low manufacturing costs.

Claims

1. A tray for cart ns comprising a base layer of tray material, a plurality of tray pockets upstanding from said base layer, wall portions of said tray pockets having an inclination relative to the base layer such as to enable similar trays to be arranged with their tray pockets nested to form a stack, at least one group of said tray pockets being so disposed relative to each other to define a carton receiving location depending therebetween and configured to define a carton receiving pocket in which a carton may be placed and positively located.

2. A tray as claimed in claim 1, wherein the tray is moulded from pulp fibre.

3. A tray as claimed in claim 1 or claim 2 wherein the base layer and tray pockets are formed integrally from the same material.

4. A tray as claimed in any one of claims 1 to 3 wherein the wall portions of said group of pockets have openings therein which openings define carton locating surfaces of the wall portions, wherein said carton receiving pocket is defined by said carton locating surfaces.

5. A tray as claimed in claim 4 wherein the wall portions which bound said openings have a generally similar configuration on both sides of the tray.

6. A tray as claimed in claim 4 or claim 5, wherein there is a regular array of tray pockets in the tray with each group of contiguous pockets having the carton locating surfaces of a carton locating pocket.

7. A tray as claimed in claim 6, wherein the tray has peripheral pockets which have the appearance of half the tray pockets and are closed at the periphery of the tray by a peripheral side wall.

8. A tray as claimed in claim 7, wherein webs are provided on said base layer of the tray which extend between said tray pockets for increasing the rigidity of the tray.

9. A tray as claimed in any one of claims 4 to 8, wherein the inclination of the wall portion of each tray pocket relative to the vertical through said base layer is in the order of 15 degrees, whereas the depending carton locating surfaces define a surface having an angle in the order of 7 degrees to said vertical.

10. A tray for cartons as claimed in any preceding claim, wherein the carton receiving pockets each house a yoghurt carton and the height of the pocket wall portions relative to the carton height is in the ratio of 1:2.

11. A tray as claimed in claim 10, wherein the base portion of the tray is provided with a ventilation aperture at the centre of each carton receiving pocket.

12. A tray for cart ns substantially as hereinbefore described with reference t the accompanying drawings.

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